

fruit bend over from their original upright orientation at fruit set to their customary hanging orientation at maturity. Fruit of cultivars varying in colour from dark red to completely green were exposed to photoinhibitory conditions ($500 \mu\text{mol m}^{-2} \text{s}^{-1}$ at 10°C for 3 h). Monitoring of chlorophyll *a* fluorescence indicated that the extent of photoinhibition increased with decreasing redness of peel, suggesting that anthocyanins provide photoprotection in pear peel. However, because fruit orientation changes to slowly, it does not appear to explain the general pigmentation pattern. Analysis of fluorescence quenching at increasing light levels indicated extreme susceptibility of pear peel to photoinhibition at low temperature, corresponding with the cold-induced synthesis of anthocyanins. This supports the hypothesis that anthocyanins provide photoprotection in pear peel in response to cold weather.

doi:[10.1016/j.sajb.2007.02.123](https://doi.org/10.1016/j.sajb.2007.02.123)

Determination of mineral elements and heavy metals in indigenous medicinal plants of KwaZulu-Natal

R.A. Street^a, C. Southway^b, W.A. Stirk^a, J. Van Staden^a

^a *Research Centre for Plant Growth and Development, School of Biological and Conservation Sciences, University of KwaZulu-Natal Pietermaritzburg, Private Bag X01, Scottsville 3209, South Africa*

^b *School of Chemistry, University of KwaZulu-Natal Pietermaritzburg, Private Bag X01, Scottsville 3209, South Africa*

The aim of this study was to determine whether the levels of heavy metals in indigenous medicinal plants could be hazardous to human health. Twelve minerals and trace elements (Al, As, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Tl and Zn) were determined in the bulbs, bark and leaves of locally available medicinal plants. These plant parts were purchased from street vendors where the plants had been exposed to various forms of urban pollution and compared to plants purchased from indoor “muthi” shops. A microwave digestion procedure was applied under optimized conditions as recommended by the WHO working document regarding quality control methods for medicinal plant materials. Elemental concentration (ppm) was determined using Inductively Coupled Plasma (ICP).

doi:[10.1016/j.sajb.2007.02.124](https://doi.org/10.1016/j.sajb.2007.02.124)

Reducing the harvesting impact on *Harpagophytum procumbens* populations in the Omaheke Region, eastern Namibia

M. Strohbach

Department of Botany, University of Pretoria, Pretoria 0002, South Africa

Harpagophytum procumbens DC is a geophyte restricted to sandy areas of the semi-arid Kalahari basin of southern Africa. Its secondary tubers are harvested extensively for the production of analgesic and anti-inflammatory medicine. Annual exports of dried tubers from Namibia have risen to as much as 800 tons, which means that between 30 and 50 million plants may be harvested every year. While this trade supports about 10,000 of the poorest communal households in the country, there are valid concerns about the impact of harvesting on the long-term survival of the species. To investigate if harvesting practices can be sustainable, *Harpagophytum* plants were monitored on permanent observation sites over a five-year period. Information collected included: typical plant distribution patterns related to overall vegetation structure, phenology, harvesting impact on age-state distribution within populations, and secondary tuber (re)generation rates, all related to the variable local rainfall as well as harvesting technique and -frequency. Inter-annual growth patterns vary considerably, depending on annual rainfall patterns, thus annual resource assessments are recommended to set harvesting quotas for communities. The optimal timing of resource assessments is late January, while harvesting starts late April, ending October. Plants harvested more frequently than once every 4 years showed little or no regeneration of secondary tubers, confirming that a minimum 4-year rotational harvesting system as well as leaving the main tuber totally undisturbed is necessary to ensure a stable population growth rate for *Harpagophytum*. The study further highlighted that overgrazing and bush-encroachment are responsible for a higher decline in plant productivity and -numbers than correct harvesting, thus stressing the importance of improving overall rangeland management if communities want to continue deriving an income from this resource. We strongly recommend the additional cultivation of *Harpagophytum* so that wild plants can be spared from harvesting during periods of extreme drought.

doi:[10.1016/j.sajb.2007.02.125](https://doi.org/10.1016/j.sajb.2007.02.125)

The vegetation ecology of Ezemvelo Nature Reserve, Bronkhorstspuit, South Africa

B.A. Swanepoel, G.J. Bredenkamp

Department of Botany, University of Pretoria, Pretoria 0002, South Africa

A vegetation survey, based on plant communities, was conducted on the Ezemvelo Nature Reserve. The aim of the study was to identify, describe and classify plant communities of Ezemvelo Nature Reserve, and interpret them ecologically. The information derived from this study can then be used in the management of the Reserve. The floristic composition and habitat information were recorded in 210 sample plots. The data was captured in the TURBOVEG database and classified using the TWINSpan numerical classification algorithm. The resulting phytosociological tables were compiled and organised